

REMARKS/ARGUMENTS

Claims 1-14 are pending.

Claims 1-14 were rejected under 35 U.S.C. § 103(a) for allegedly being unpatentable over Raz et al., U.S. Patent No. 5,852,715 in view of Kurauchi et al., U.S. Patent No. 6,704,489.

The Prior Art

Raz et al. describe updating a working database on an ongoing basis. While the working database is being updated on an ongoing basis, generating a copy of the working database. The copy of the database is used to generate a support copy of the database. The support copy in turn is used for the purpose of implementing decision support functions.

Abstract. Fig. 1 shows a volume 80 having a database, and a volume 82 having a concurrent copy of the database. *Col. 7, lines 29-31, col. 8, lines 53-56, see also col. 9, lines 60-65.* Fig. 1 also shows volume 90 which stores a mirror of the database on volume 80. *Col. 9, lines 27-29.* Although not explicitly disclosed, as best understood, volume 92 shown in Fig. 1 appears to be a mirror of the concurrent copy of 82. *Col. 9, lines 63-65.*

Kurauchi et al. disclose a resource management database that stores resource management information and key information for each resource. Upon receipt of a resource use request from an application program, the resource manager judges whether the requested resource can be allocated to the application program by referring to the resource capacity and the currently-allocated volume of the resource in the information database. If judging that the requested resource can be allocated, the resource manager gives authorization to the application program to use the resource. The resource manager also restricts a data transfer bandwidth used by an application program and requests a resource release on expiration of a time period.

Abstract.

The Claims Distinguished

As for independent **claim 1** recites a disk storage system storing a plurality of heterogeneous databases and a module that combines databases, where the module controls data transfer bandwidth for reflecting update data from one of the databases in said disk storage system to another of the databases, in response to receiving user-requested specifications. Claim 1 further recites that the disk storage system performs resource allocations for that bandwidth.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases. Moreover, Raz et al. do not disclose or suggest a module that combines databases. Since Raz et al. clearly disclose creating concurrent copies or creating mirrors of the volumes, there is no motivation for a module that *combines* the duplicated databases.

Contrary to the Office action, Kurauchi et al. do not show or suggest a module that combines databases. A review of column 15, lines 38-45 cited in the Office action does not disclose a module that combines databases. Rather Kurauchi et al. describe servers 2200a to 2200n are service programs corresponding to, for example, device drivers. Each server refers to the key information specified by the key ID received from a client and uses corresponding resource 2300a to 2300n in accordance with the key information. The servers accordingly control executions of data transfer, data input, and data output using the resource 2300a to 2300n. Respectfully, this does not teach or even suggest a module that combines databases. In fact, Kurauchi et al. make no mention of combining databases.

The references individually do not teach features recited in claim 1. The references considered in combination, do not teach or suggest features recited in claim 1. The Section 103 rejection of independent claim 1 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 2** recites a disk storage system storing a plurality of heterogeneous databases and a module that combines databases, where the module determines a required bandwidth and resources therefor in order to satisfy user-requested specifications that

specify a requested refresh rate and a replication data volume. Claim 2 further recites that the disk storage system performs resource allocations for that bandwidth.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases. Moreover, Raz et al. do not disclose or suggest a module that combines databases. Since Raz et al. clearly disclose creating concurrent copies or creating mirrors of the volumes, there is no motivation for a module that *combines* the duplicated databases.

Contrary to the Office action, Kurauchi et al. do not show or suggest a module that combines databases. A review of column 15, lines 38-45 cited in the Office action does not disclose a module that combines databases. Rather Kurauchi et al. describe servers 2200a to 2200n are service programs corresponding to, for example, device drivers. Each server refers to the key information specified by the key ID received from a client and uses corresponding resource 2300a to 2300n in accordance with the key information. The servers accordingly control executions of data transfer, data input, and data output using the resource 2300a to 2300n. Respectfully, this does not teach or even suggest a module that combines databases. In fact, Kurauchi et al. make no mention of combining databases.

The references individually do not teach features recited in claim 2. The references considered in combination, do not teach or suggest features recited in claim 2. The Section 103 rejection of independent claim 2 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 3** recites a module that controls refreshes responsive to a requested refresh rate, a module that controls replica creation based on intervals based on the requested refresh rate. Claim 3 recites a disk storage system that stores a plurality of heterogeneous databases, where the disk storage subsystem reflects update data from a first database to a second database that is different from said first database under control of the module that controls replica creation.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases.

A review of Kurauchi et al. reveals that the reference does not show or suggest a module that controls replica creation based on intervals based on a requested refresh rate. Contrary to the Office action, the specific cites to Kurauchi et al. made therein do not show or even suggest, a module that controls replica creation based on intervals based on a requested refresh rate. Thus,

column 3, line 66 to column 4, line 6 describes centralizing the management of the usage limit and the allocated volume for each resource so that each application program can obtain authorization to use a resource when it is available, only by sending a resource use request to the resource use managing unit. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 4, lines 56-65 describes when the request receiving unit has received the resource use request and the resource use managing unit judges that a first capacity that is equal to or greater than the capacity shown by the minimum capacity information is available, the resource use managing unit may give authorization to the application program to use the resource. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 5, lines 53-60 describes the resource may be used as a data transfer path and the resource use managing unit may give authorization to the application program by transferring an ID that specifies current capacity information included in the authorization information. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 6, lines 63-65 describes the resource allocation is dynamically controlled in accordance with the currently-allocated volume of the resource so that

the resource can be effectively used. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 7, lines 55-65 describes period information which refers to start and stop times; however, there is no discussion of replica creation based on intervals based on a requested refresh rate.

column 9, lines 46-53 discusses allocation of CODECs. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 14, lines 42-45 describes that a PCI bus 1040, a hard disk drive 1061, and a memory 1020 used as resources for transferring data have respective limits to their data transfer bandwidths. This does not pertain to replica creation based on intervals based on a requested refresh rate.

column 15, lines 1-8 refers to the resource management DB, but does not describe replica creation based on intervals based on a requested refresh rate.

The references individually do not teach features recited in claim 3. The references considered in combination, do not teach or suggest features recited in claim 3. The Section 103 rejection of independent claim 3 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 4** recites a computer system with a plurality of database management systems. Claim 4 recites a disk storage system that stores a database and a module that combines databases. When data from a data warehouse database is to be reflected in a plurality of data marts, the module measures replication processing time and, if the processing time is at or exceeds requested specifications, creates a replica of a data warehouse database in the disk storage system.

Raz et al. do not disclose or suggest a module that combines databases. Since Raz et al. clearly disclose creating concurrent copies or creating mirrors of the volumes, there is no motivation for a module that *combines* the duplicated databases.

Contrary to the Office action, Kurauchi et al. do not show or suggest a module that combines databases. A review of column 15, lines 38-45 cited in the Office action does not disclose a module that combines databases. Rather Kurauchi et al. describe servers 2200a to

2200n are service programs corresponding to, for example, device drivers. Each server refers to the key information specified by the key ID received from a client and uses corresponding resource 2300a to 2300n in accordance with the key information. The servers accordingly control executions of data transfer, data input, and data output using the resource 2300a to 2300n. Respectfully, this does not teach or even suggest a module that combines databases. In fact, Kurauchi et al. make no mention of combining databases.

A review of Kurauchi et al. reveals that the reference does not show or suggest a module that measures replication processing time and, if the processing time is at or exceeds requested specifications, creates a replica of a data warehouse database in said disk storage system. Contrary to the Office action, the following cites to Kurauchi et al. made therein and discussed above do not show or even suggest, a module that measures replication processing time and, if the processing time is at or exceeds requested specifications, creates a replica of a data warehouse database in the disk storage system. Thus,

column 3, line 66 to column 4, line 6

column 4, lines 56-65

column 5, lines 53-60

column 6, lines 63-65

column 7, lines 55-65

column 9, lines 46-53

column 14, lines 42-45

column 15, lines 1-8

do not pertain to measuring replication processing time and, if the processing time is at or exceeds requested specifications, creating a replica of a data warehouse database in the disk storage system.

The references individually do not teach features recited in claim 4. The references considered in combination, do not teach or suggest features recited in claim 4. The Section 103 rejection of independent claim 4 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 5** recites a method including allocating resources to perform a copy within a disk storage subsystem, the disk storage subsystem comprising a first database and a second database different from the first database. Claim 5 further recites replicating content from the first database to the second database using resources in the disk subsystem substantially independently of sending content over the network.

Raz et al. do not show or suggest a first database and a second database different from the first database. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention a first database and a second database different from the first database.

The references individually do not teach features recited in claim 5. The references considered in combination, do not teach or suggest features recited in claim 5. The Section 103 rejection of independent claim 5 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 8** recites computer code for allocating resources to perform a copy within a disk storage subsystem which comprises a first database and a second database different from the first database, and code for replicating content from the first database to the second database using resources in the disk subsystem substantially independently of sending content over a network.

Raz et al. do not show or suggest a first database and a second database different from the first database. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention a first database and a second database different from the first database.

The references individually do not teach features recited in claim 8. The references considered in combination, do not teach or suggest features recited in claim 8. The Section 103 rejection of independent claim 8 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 9** recites a disk storage subsystem, wherein the disk storage subsystem copies content from a first database to a second database that is different from the first database and wherein the disk storage subsystem copies content in accordance with a

resource allocation received from one of a plurality of computers. The resource allocation is based upon at least one of a plurality of data transfer capacity settings determined by the computer in accordance with a data transfer capacity and at least one of a plurality of received specifications.

Raz et al. do not show or suggest a first database and a second database different from the first database. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention a first database and a second database different from the first database.

The references individually do not teach features recited in claim 9. The references considered in combination, do not teach or suggest features recited in claim 9. The Section 103 rejection of independent claim 9 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 10** recites a disk storage subsystem which replicates content of a first database to a second database. The first database and the second database are disposed in a disk storage subsystem. The first database being different from the second database. The disk storage subsystem allocates resources to perform content replication within the disk storage subsystem and replicates content from the first database to the second database.

Raz et al. do not show or suggest a first database and a second database different from the first database. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention a first database and a second database different from the first database.

The references individually do not teach features recited in claim 10. The references considered in combination, do not teach or suggest features recited in claim 10. The Section 103 rejection of independent claim 10 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 11** recites a computer system with a plurality of database management systems. Claim 11 recites a disk storage system storing a plurality of heterogeneous databases and a means for receiving user-requested specifications and for

controlling data transfer bandwidth involved in reflecting update data from a database in the disk storage system to another and different database.

Raz et al. do not show or suggest a first database and a second database different from the first database. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention a first database and a second database different from the first database.

The references individually do not teach features recited in claim 11. The references considered in combination, do not teach or suggest features recited in claim 11. The Section 103 rejection of independent claim 11 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 12** recites a computer system with a plurality of database management systems. Claim 12 recites a disk storage system storing a plurality of heterogeneous databases and means for receiving user-requested specifications relating to a requested refresh rate and a replication data volume. Claim 12 recites a means for determining required bandwidth and resources therefor in order to satisfy said user-requested specifications, and a means for controlling resources of said disk storage system. The disk storage system performs resource allocations for that bandwidth.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases.

A review of Kurauchi et al. reveals that the reference does not show or suggest a module that controls replica creation based on intervals based on a requested refresh rate. Contrary to the Office action, the following cites to Kurauchi et al. made therein and discussed above do not show or even suggest, a module that controls replica creation based on intervals based on a requested refresh rate. Thus,

column 3, line 66 to column 4, line 6

column 4, lines 56-65

column 5, lines 53-60

column 6, lines 63-65

column 7, lines 55-65

column 9, lines 46-53

column 14, lines 42-45

column 15, lines 1-8

do not pertain to replica creation based on intervals based on a requested refresh rate.

The references individually do not teach features recited in claim 12. The references considered in combination, do not teach or suggest features recited in claim 12. The Section 103 rejection of independent claim 12 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 13** recites a computer system performing database replication. A disk storage system stores a plurality of databases and includes an interface relating to a plurality of heterogeneous database management systems. Claim 13 recites a means for creating replicas creating snapshots of a database, a means for receiving user-requested specifications relating to requested data refresh rates and replication data volume, and a means for specifying a number of said host paths, a number of said shared volumes, and a number of replicas based on snapshots in order to satisfy said requested specifications. The disk storage system allocates the specified host paths and shared volumes, and executes snapshots.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases.

A review of Kurauchi et al. reveals that the reference does not show or suggest a means for creating replicas creating snapshots of a database or a means for specifying a number of said host paths, a number of said shared volumes, and a number of replicas based on snapshots in order to satisfy said requested specifications. Contrary to the Office action, the following cites to Kurauchi et al. made therein and discussed above do not show or even suggest, a means for creating replicas creating snapshots of a database or a means for specifying a number of said host paths, a number of said shared volumes, and a number of replicas based on snapshots in order to satisfy said requested specifications. Thus,

column 3, line 66 to column 4, line 6

column 4, lines 56-65

column 5, lines 53-60

column 6, lines 63-65

column 7, lines 55-65

column 9, lines 46-53

column 14, lines 42-45

column 15, lines 1-8

do not pertain to creating replicas by creating snapshots of a database, or to specifying a number of said host paths, a number of said shared volumes, and a number of replicas based on snapshots in order to satisfy said requested specifications.

The references individually do not teach features recited in claim 13. The references considered in combination, do not teach or suggest features recited in claim 13. The Section 103 rejection of independent claim 13 is believed to be overcome, for at least the foregoing reasons.

As for independent **claim 14** recites a computer system with a plurality of database management systems. Claim 14 further recites a means for controlling refreshes receiving a requested refresh rate, a means for creating replicas controlling replica creation. Claim 14 further recites a disk storage system storing a plurality of heterogeneous databases, and reflecting update data from a database to another different database based on control from the replica creating means.

Raz et al. do not show or suggest a heterogeneous databases. As discussed above, the volumes 80, 82, 90, and 92 disclosed by Raz et al. are copies or mirrors of the database in volume 80. No where do Raz et al. mention heterogeneous databases.

A review of Kurauchi et al. reveals that the reference does not show or suggest a means for controlling refreshes receiving a requested refresh rate. Contrary to the Office action, the following cites to Kurauchi et al. made therein and discussed above do not show or even suggest, a means for controlling refreshes receiving a requested refresh rate. Thus,

column 3, line 66 to column 4, line 6

column 4, lines 56-65

column 5, lines 53-60
column 6, lines 63-65
column 7, lines 55-65
column 9, lines 46-53
column 14, lines 42-45
column 15, lines 1-8

do not pertain to replica creation based on intervals based on a requested refresh rate.

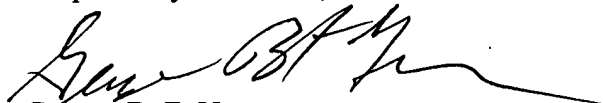
The references individually do not teach features recited in claim 14. The references considered in combination, do not teach or suggest features recited in claim 14. The Section 103 rejection of independent claim 14 is believed to be overcome, for at least the foregoing reasons.

CONCLUSION

In view of the foregoing, Applicants believe all claims now pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at 650-326-2400.

Respectfully submitted,


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